



Project Planning & Implementation

Small Wind Systems Tutorial
Village Power Conference Workshop



Market Development

- ❖ **Market Development of Decentralized Renewables for Rural Electrification is Slow and Often Frustrating**
- ❖ **Multiple Technologies and Service Levels Required**
- ❖ **Least Cost (Life Cycle) Planning >> Decentralized Systems**
- ❖ **Access to Financing >> Decentralized Systems**
- ❖ **Politicians Are Important**
- ❖ **Projects, Projects, Projects - Not Paper!**



Project Development

1. Identify a Need
2. Define Project: Who, What, Where, When, & Why
3. Conduct Pre-feasibility Study and Bracket Design
4. Seed Funding
5. Detailed Project Design (Technical, Institutional, & Financial) and Site Monitoring
6. Project Financing
7. Procurement and Contractor(s) Selection
8. Installation and Training
9. Operations and Support



Step 1: Identify A Need

Small Wind Turbines Can Be A Remedy To Some Common Problems With Conventional Rural Electrification/Water Supply Approaches:

- ❖ **Provide Service To Areas Not Scheduled For Grid Electrification For 10 Or More Years**
- ❖ **Reduce Need For Electrification Subsidies**
- ❖ **Overcome Operational Problems With Existing Diesel Electric Mini-Grids And Diesel/Kerosene Pumps**
- ❖ **Reduce Fuel Use**



Step 2: Project Definition

- ❖ **Where are the Sites?**
- ❖ **What are the Desired Outcomes (Clean Water, 24 Hr Electrification, Etc.)?**
- ❖ **What is the Rough Schedule?**
- ❖ **What are the Likely Sources of Funding?**
- ❖ **How will Costs be Recovered?**
- ❖ **Who Will Implement the Project?**
- ❖ **Who Will be Responsible for the Equipment?**



Step 3: Pre-feasibility Study

- ❖ What are the Loads?
- ❖ Is There a Usable Wind Resource?
- ❖ Is Wind Energy a Good Technical Option?
- ❖ Is Wind a Least-Cost or Otherwise Preferable Option?
- ❖ What are the Possible Alternate Technical Approaches and Which is Best?
- ❖ What is it Likely to Cost?
- ❖ How Long Will it Take?
- ❖ What are the Institutional Plans for Implementation, Operations and Maintenance, and Cost Recovery?
- ❖ Is the Project Fundable or Financable?



Step 4: Seed Money

- ❖ **Preparing Projects for Financing and Implementation (Bidding, Etc.); Particularly Where New Technical Approaches are Attempted, Requires a Surprising Amount of Work**
- ❖ **Direct and In-Kind Support for Project Preparation Usually Available from Other Local Agencies, NGO's, Bi-Lateral or Multi-Lateral Donors/Funders, Etc.**



Step 5: Detailed Project Design

- ❖ **Monitoring and Analyses of Wind Resources**
- ❖ **Detailed Technical Design and Budgeting**
- ❖ **Institutional Plans**
- ❖ **Economic Analyses**
- ❖ **Financial Projections and Planning**
- ❖ **Identify Participants**



Step 6: Project Financing

- ❖ **Wind Projects are Capital Intensive - So Lining Up Financing is Always a Challenge**
- ❖ **Projects with Small Wind Systems Usually Involve Public Financing, But Some Privately Financed Projects are Emerging**
- ❖ **Some Experimentation with Sanctioned Private Sector Rural Power Projects is Beginning**
- ❖ **Donor Aid has a Role ... Distortion vs. Leverage**
- ❖ **Multi-Lateral Banks are Becoming More Receptive to Decentralized Power**
- ❖ **Global Environmental Facility Funds can Provide Important Leveraging**



Step 7: Procurement

- ❖ **Recommend Purchasing from Experienced Local Dealers Whenever Possible**
- ❖ **Public Projects Must be Tendered, So Specifications and Bid Documents Must be Prepared**
- ❖ **Since These are Often “First of a Kind” Procurements, Lots of Hand-Holding Required**
- ❖ **Customs Clearance is an Important Consideration**
- ❖ **It Takes a Significant and Sustaining Domestic Market to Attract Foreign Investment in Local Manufacturing**



Step 8: Installation and Training

- ❖ **Installation Usually Goes Quickly Once it Gets Going**
- ❖ **Factory Technicians and Engineers Can be Quite Helpful, But Their Participation can be Expensive**
- ❖ **Recommend Having Users Directly Involved in the Installation Work**
- ❖ **Conduct Training During System Test and Approval Work, Just After Commissioning**
- ❖ **Some Period of System De-Bugging Should be Expected**



Step 9: Operations and Support

- ❖ **Operations and Support are Critical and Must be Carefully Designed from the Very Beginning**
- ❖ **Every System Will Have an Operator (and/or Guard), Who Must Understand Basic Operating Principles ... They are There to Respond to Problems**
- ❖ **Turnover of Trained Operators and Technicians is a Serious and Recurring Problem**
- ❖ **Improper Operation can be a Major Source of Problems ... And it can be Hard to Identify**
- ❖ **Very High System Reliability is Possible, With Minimal Maintenance Inputs**

